Swedish regional development initiatives in a gender perspective.
A regional policy programme evaluated against a transversal objective

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1. Introduction

Gender equality has long been a focus of regional development in the European Union. In a Swedish context, the interest has been borne from the fact that rural and sparsely populated areas and industrial areas in decline have a population with a surplus of men, and that this tendency is accelerating as young women move to cities, while young men stay in the rural areas. In about a fifth of municipalities in Sweden, there are more than 120 young men (ages 18 to 30) to 100 young women. Young women abandon the rural areas for cities more readily and in larger numbers than men, and many young women find the life opportunities in small communities and rural areas restricting, especially young career-ambitious women from a middle class background see e.g. Svensson (2006).

Several remedies to this dilemma has been proposed, and one field of analysis stresses the gender-segregated nature of the Swedish labour market and the relative paucity of employment opportunities for women in rural areas. Employment opportunities in the private sector exist mainly in the primary sectors agriculture, forestry and mining, traditionally male labour markets. The traditionally female labour market consists largely of relatively low-skill, low-income jobs in the public sector. For this reason, policy has expressed an interest in self-employment and female entrepreneurship as a way to create employment opportunities for women in rural and sparsely populated areas as well as a way to create new industries with more employment opportunities for women.

Entrepreneurship policy directed towards women has been implemented as a special programme during the period 2007-2009. As a part of this, funds were extended to support investments in innovations for female-led companies. The programme consisted of a budget of approximately €3 Million, from which women entrepreneurs could apply for loans up to € 7 500.

There are also several programmes designed to encourage entrepreneurship and investment in rural areas. State aid to businesses motivated by regional development goals amount to € 150 -

200 Million annually.[1] About a third of this aid (app € 50 Million 2009) is granted in the form of Regional Investment Grants and Regional Development Grants. The purpose of the grant schemes is to enhance the conditions for growth in the receiving regions and promote sustainable growth in firms that receive the grants. Supporting investment in firms that provide employment to women – especially in skilled occupations – could give both direct effects of the investment, and indirect effects if more women stay in the region as a consequence of a more varied labour market. From the relative sizes of the policy programmes for female entrepreneurship and regional development, it is clear that the potential for a firm to find additional funding for an investment is much greater within the policy area of regional development than "female entrepreneurship".

Mainstreaming gender issues in regional development policies has been in effect since the 1990's, see e.g. Hafner-Burton and Pollack (2009). However, the policy area has no measurable goals or objectives relating to the transversal objectives (gender neutrality, social cohesion, integration and environmental sustainability) and programme and policy outcomes are seldom measurable, realistic outcomes related to the transversal objectives. Previous studies have noted that there seem to be relatively few regional investment and development grants awarded to female-led firms.[2] This raises the question of whether there are rules regulating the grants that disproportionally disadvantage female-led firms, and hence is in conflict with the stated secondary (transversal) objective of the grants to promote gender equality and provide a more varied labour market.

This paper deals with the application and approval of regional investment and regional development grants to female-led firms in Sweden. The main question under study is whether (*i*) the rules of eligibility surrounding the grant schemes disadvantage female-led firms, and whether there is a difference between male-run firm and female-led firms in the (*ii*) likelihood of applying for the grant or (*iii*) have the grant approved given an application. Ultimately the goal is to assess the potential of the regional development and regional investment grants to promote the goal of a more varied labour market for women in disadvantages regions.

In a policy context, the degree to which the grants benefit women depends on the success in providing employment opportunities and a more varied labour market for women. Given this fairly loose definition; gender fairness is here defined as to what extent female-led firms are eligible for the grant in comparision with male-led firms.[3]

[1] Tillväxtanalys (2010)
[2] Nutek (2008),
[3] This is a rather restrictive criteria of a "gender fairness". There are alternative interpretations of criteria that could be taken as "firms that benefit the employment and entrepreneurial opportunities of women". Two alternative criteria (proportion of women employed in the industry > 60 percent and –for Limited Liability

The paper does not address whether increased female self-employment or entrepreneurship is effective in creating a wider variety of employment opportunities for women or in decreasing outmigration from rural and sparsely populated areas. Neither does the paper address the issue whether the investment grants are a good way of promoting economic growth and a more varied labour market in the eligible areas. These are good questions for further research, but beyond the scope of this paper.

In the first section of the paper the eligibility rules for the Regional Investement Grant and the Regional Development Grant are laid out, and the criteria are operationalised to factors observable in available data. The subsequent section contains the empirical results for the questions posed: is the application process gender neutral (section 3.2), are female-led and male-led firms equally likely to apply for the grant (section 3.3), and what rules of eligibility have an adverse effect on the possibility for female-led firm to take advantage of the policy programme (section 3.4).

There is no evidence that the applications for grants discriminated againt female-led firms, as female-led and male-led firms have applications approved at about the same rate. In addition, female-led firms apply for the grant to a similar extent as male-led firms, which leads to the conclusion that differences in application rates mainly reflect differences in the kinds of firms men and women lead. The rules of eligibility restricts the number of female firms that are eligible for the grants more than it restricts male-led firms. The eligibility criterion that restricts the potential for female-led firms from being eligible for the grants the most is the criterion that to be eligible, a firm should operate on a larger than local or regional market. In conclusion, there seems to be limited potential for these grant schemes to influence the transversal policy goal to improve the employment opportunities for women in rural areas.

2. Regional investment grants and regional development grants in Sweden

Regional Investment grants and Regional Development grants are types of state aid to investments in vulnerable areas of Sweden, with the objective of bolstering growth, and maintaining a balanced regional development. Regional Investment Grants (*RIG*) are open to application from all firms and selected government agencies and Regional Development Grants (*RDG*) are open to applications from small and medium sized firms in the private

companies – the share of women board members should exceed 60 percent) have been investigated, and the results remain qualitatively unchanged.

sector, that operate under market conditions.[4] The regulations surrounding the grant schemes are summarised in Table 1.

Table 1: Summary of the regulations surrounding Regional Investment Grants and Regional Devlopment grants.

	RIG	*RDG*
Eligible investment costs	Investments in capital assets, education, immaterial capital assest, consulting fees and one participation in one product exhibition or fair (per product)	Investments in buildings, machines and inventory (excluding vehicles) , product development, marketing and competence building.
Where	Eligible support area A and B	Eligible support Area A and B, and rural areas elsewhere
To Whom?	Firms, government agencies that operate not under government appropriation	Small and medium sized private firms, that operate under market conditions.
Maximum grant	No limit	€ 100 000 (before 2007)-€200 000 (2007-) over three years to the same firm
Activities	Industrial activity or activity "similar to industrial activity Industrial services Service industries Tourism	(no explicit limit on activities)
Grant prohibited	Agricultural, forestry, waterculture, fisheries Shipbuilding and shipping Steel industry Production of coal and synthetic fibres	Activites associated with sale and process of agricultural products.
Limits	Firms active in Service industries should operate on a market larger than the regional market	Firms active in Service industries should operate on a market larger than the local market

These grants are a part of regional policy. As such, the intended effect of the grant is to create a competetive advantage to firms operating in the eligible region in relation to firms operating outside the eligbile region. The grant should be competetively neutral between firms within the region. In the regulations surrounding the grant schemes this requirement amounts to a requirement that firms should operate on a market that is not local (RDG) or regional (RIG).

[4] Small and medium sized firms are firms with less than 250 employees and a net turnover of less than € 2 million annually. (DEF). Over 99 per cent of registred firms in Sweden are small and medium sized firms.

Firms can apply for grants covering up to 50 per cent of the investment depending on the planned localisation of the investment and the type of investment made. Regional Investment grants may be granted to firms making investments in eligible "support areas", sparsely populated and peripheral regions in the north of Sweden (Appendix 2). Regional Development Grant is open to small and medium sized firms in the support area and in rural areas in other parts of Sweden. Small and medium sized firms investing inside the support area are thus eligible for both types of grant.

There is no upper limit on the amount that can be granted as Regional Investment Grant, but the grant is considered state aid, which is regulated by rules set out by the European Union.[5] Regional Development Grant is considered *de minimis* aid, which means that there are less restrictions on the type of activity that may receive state aid. *De minimis* aid can not exceed € 200 000 (€ 100 000 before 2007) over a three year period.[6]

There are no specific activities targeted in the regional aid schemes. RIG is targeted towards *industrial activities in manufacturing, services or tourism,* a definition broad enough to be practically meaningless. The regulations surrounding the RDG state no targeted activities at all. State aid schemes are subject to several EU regulations prohibiting or restricting aid to specific activities. The regulations surrounding the RIG prohibits aid to agriculture, shipping, mining of coal, and the production of steel and synthetic fibers.[7] Prohibitions on aid for the RDG only exclude aid to activities surrounding the agricultural sector (process and sale of agricultural products.

2.1. Operationalised criteria for eligibility

The general purpose of the grant scheme is to improve the competitive advantage to firms operating in the relevant support area in relation to firms outside the support area. At the same time, the grants should not give a competitive advantage to one firm over another within the support area.

The criteria for which firms are eligible for support are defined from the guidelines set out in a handbook for executives that in the agency that award the grants.[8] The criteria used by the granting authority uses information exclusive to the applying firm, and is hence not applicable to the pool of all firms. Where appropriate, an analysis of the comptetitive situation in the local market is recommended.

[5] EU C115/61, Article 107 and 108.
[6] EC 1998/2006.
[7] Products prohibited from receiving state aid are listed in EU C321, Appendix 1 (Agricultural products), EU 1540/1998 (Shipping), steel and synthetic fibres EU 2006/C54/08 and EU 1407/2002 (mining of coal). The prohibition does not apply to de minimis aid, apart from agricultural products.
[8] Tillväxtverket (2009).

Since there is a fundamental discrepancy between what can be given aid (a project) and who can apply for aid (a firm), there will be firm that receive aid for a project, but the firms is considered not eligible for support. The operationalisations do not reflect the actual decision-making process, but rather seek to mimic the outcome of this process. [9] Since there is no way to assess the competitive outcome of an undefined project in an undefined market, some assumptions must be made about the relations between firm and project. The basic assumptions are that investments are primarily made in the industry in which the firm is currently active in the type of region where the firm is currently active.[10]

The first rule in the handbook states that firms must operate ”under market conditions” in order for the firm to be eligible for the grant. This is taken to mean that firms are expected to compete in a marketplace and should not rely on grants or subsidies for operating costs. Since the data set consists mainly of privately controlled firms, this rule is interpreted as the firm returning positive factor income, either in the form of wages or business income.

Regional development grants are awarded to small and medium-sized businesses with less than 250 employees and a turnover of less than € 2 million annually. These are characteristics directly observable in the data set.

Some activities – or rather products – are explicity prohibited to receive state support. These include activities around the marketing and refinement of agricultural products (EG C321, appendix 1), shipbuilding (EG1540/98), the mining of coal (EG 1407/2002), the production of steel and the production of synthetic fibres (EG 2006/C54/08). The products are identified by a product number in the combined nomenclature (CN), or, in the case of activities related to shipping, in plain text. The prohibited products are translated into activity codes, and a firms whose main industry is the production of a prohibited good is assumed to be not eligible for the grant.[11] Keys between product codes in the combined nomenclature and a national variation of NACE activity codes (SNI) was provided by Statistics Sweden and is available on request.

The third criteria concerns the locality of the planned activity. Since the actual planned locality is a characteristic of the project and not the firm, this does in reality not affect the pool of eligible firms. About a thirty per cent of applications concern new establishments. It could be argued that since a firm is more likely to expand in a region close to where current operations

[9] This is an improvement from Nutek (2008) in which an alternative method is used, where around 60 per cent of grants are given to firms not considered eligible.

[10] With the methods and criteria used, up to 20 per cent of grants are given to firms that are not considered eligible for the grants. EFFECT OF REGION?

[11] It is entirely possible for a firm whose main activity is in the production of goods which are prohibited from receiving state aid, to plan a project in which the activities are not prohibited from state aid. Hence there will be a discrepancy, so that firms that are considered not eligible for state aid, still could be granted aid.

are located, not having any plant located in the regional are targeted by the grant schemes is a *de facto* eligibility criteria. However, almost 50 per cent of grants are given to firms that did not have an existing plant in the relevant support area.

Finally, there is the criterion of competetive neutrality: that the grants should give a competitive advantage in relation to firms outside the region, without changing the competitive relation between firms within the region. The interpretation of this criterion is that firms that operate on a local or regional market are generally not eligible for the grant.

Information about the geographical dispersion of a firm's 'market' is not readily available. The appropriating agency can ask for information about the firm that apply for the grant, but this information is not available for firms that do not apply for the grant. In order to observe the contrafactual state where a firm that has *not* applied for a grant *would* be considered eligible for the grant, the rules for competitive neutrality must be operationalised to characteristics observable from available register data, which is available for all firms, not just firms that have applied for the grant. In this paper, a measure of geographical dispersion of employment is used as an indication of whether an industry operates on a 'local or regional' market.

1.1.1 Local or regional market

The geographical dispersion of employment in the sector is assumed to indicate geographical market size. Industries where employment is geographically scattered is arguably more likely to be a largely 'local' market, while an industry where employment is concentrated to a few locations is more likely to operate on a national or international market. The ability to geographically separate production from consumption determines the 'geographical market size', i.e. if a market is local, regional, national or indeed global.

While it is commonly noted that free trade permits separation of production and consumption (Venables (1998)), the reverse is also true: that (regional or international) trade in services can only occur if the production and consumption of the service can be disentangled. The degree to which production can be separated from consumption is a question of the current state of technology and transport costs, which determines storability, transportability and the cost of transport for a good or service. The localisation pattern that emerge from this insight is one of the driving forces behind Krugmans (1991) New Economic Geography. Many industries (and indeed occupations) previously thought protected have opened up for trade by advances in modern information technology and decreased transport cost, and by extension has affected the localisation of economic activitity.

The potential geographical size of a market depends largely on the tradability of the good produced. Hence the measure of the likelihood that the firms operate on a larger than local

market is closely linked to a measure of tradability inspired by Jensen and Kletzer (2005), who argue that geographical dispersion of employment can be seen as a measure of tradability.

The measure used is a gini coefficient measuring the geographical dispersion of employment in an industry using the relative employment share L_{ir} in industry i and region r. The relative employment share L_{ir} is calculated:

$$L_{ir} = \frac{E_{ir}}{\sum_{r} E_{ir}} \cdot \frac{\sum_{i}\sum_{r} E_{ir}}{\sum_{i} E_{ir}}$$

where E_{ir} is employment in sector i in region r. The gini coefficient is calculated by comparing the actual distribution of the relative employment share L_{ir} over all regions with a theoretically completely even distribution. The gini coefficient for selected activities with the highest and lowest gini coefficients are presented in Appendix 1. Not surprisingly, education, childcare and care for the elderly, 'other service activities' which include services like hairdressing, laundry service and funeral services are regionally dispersed activities, where the market is mainly local. These activities are closely linked to demand and with current technology the decoupling of production from consumption is not likely. Retail in stores is also, not surprisingly, a dispersed activity assumed to operate mainly on a local market, while retail sale not in stores (i.e. mail order) is geographically not as dispersed. Infrastructure services, such as land transport and courier services, are dispersed activities, as are services related to construction and letting of buildings. Most highly concentrated industries are, as could be expected, manufacturing industries.

Geographical dispersion of employment is a continous measure of geographical market size. For our purposes, an industry is assumed to have a local market logic if the gini coefficient for that industry is less than 0.25. This limit is arbitrary, but is chosen to reflect the industries that are indicated as having local markets in the guidelines of the appropriating agency.

3. Empirical results

There are three empirical questions to be addressed to evaluate the regional policy grant schemes against the objective that the policy should promote gender equality in the supported areas. The first concerns the application process: whether female-led firms applying for grants are not disadvantaged just because the applicant is a female-led firm. The second question concerns uptake: whether there is a tendency that an eligible female-led firm is less likely to apply for the grant than a similar eligible male-led firm. The third question concerns the rules of eligibility: whether the rules of the policy make female-led firms less likely to be eligible for

the grants, and if so, what rules disadvantages women? The study covers the period 2004 to 2008, since that is the period for which the identity of the business manager is known.

3.1. Data

Data about application for grants are from the grant appropriating agency, the Swedish Agency for Regional and Economic Growth. Data covers all applications for both Regional Development Grant and Regional Investment Grant between 2002 and 2008. In total there are around 16 500 applications during this period, mostly for the Regional Development Grant.

This data is completed with data from the complete register of registered firms in Sweden. The information available for each firm is basic information, such as industry and municipality of residence, along with the firm's income statement and balance sheet. The source of the information is the Swedish Statistical Business Register (*Företagsdatabasen*) and Structural Business Statistics (*Företagens ekonomi*). In addition, information about the business manager is sourced from Statistics Sweden's database that aims identify the business manager for all Swedish firms (*Entreprenörskapsdatabasen*). The data consists of administrative data collected for tax purposes and is considered to be of high quality and reliability. Not all firms that applied for grants could be found among registered firms. Potential reasons for this discrepancy may be because some firms did not exist at the time of application, or because of mistakes during the data registration process.

Data concerning the employment structure – regional dispersion of employment and the proportion of female employment by industry – is calculated from micro data from Register-based Labour Market Statistics, Statistics Sweden.

3.2. Rejection rates for grant applications

In this section, I study the likelihood that a firm with a female business manager applies for the grant relative to a similar male-led firm in the same industry. The number of applications for grants during the studied period is presented in Table 2.

Around 2 000 applications for Regional Development Grant and 100 – 2000 applications for Regional Investment Grant are processed every year. The number of applications for grants has declined over the studied period. The proportion of applications for the Regional Development Grants from female-run firms is comparable to the number of female-led firms in the pool of all eligible firms.[12] The share of applications for the Regional Investment Grant from female-led firms is much lower. This may reflect the fact that most firms that are eligible

[12] Eligibility defined in section 2.1.

for the Regional Investment Grant are also eligible for the Regional Development Grant. The discrepancy is mainly due to the fact that large firms (more than 250 employees) are not eligible for the smaller Regional Development Grant, and the proportion of female-led firms in this category is low. Less than 10 percent of firms that are only eligible for the Regional Investment Grant are female-led.

Table 2: Grant applications 2004 – 2008.

	Regional Development Grant			*Regional Investment Grant*		
Year	Applications	From female-led firms	Eligible female–led firms (1)	Applications	From Female-led firms (1)	Eligible female-led firms(2)
2004	2,487	20%	18%	257	3%	6%
2005	2,273	20%	18%	268	4%	6%
2006	2,217	19%	19%	167	9%	7%
2007	1,805	20%	19%	111	7%	8%
2008	1,778	23%	19%	117	13%	8%

(1) Proportion of female-led firms of firms with a known business manager.
(2): Eligible in this context refers to firms that exclusively are eligible for the RIG.
Källa: NYPS, Swedish Agency for Economic and Regional Growth.

The number of grants awarded is very high relative the number of applications: generally around 90 percent of applications are awarded the grant. There is also virtually no difference in the proportion of grants awarded to female-led firms or male-led firms. The proportion of applications from female-led firms is roughly equivalent to the proportion of eligible female-led firms.

Table 3: Descriptive statistics for firms that applied for a grant between 2004 and 2008

	RDG			RIG		
	Male-led	Female-led	Unknown	Male-led	Female-led	unknown
No employees	15	4	5	136	69	69
Turnover (1000€)[1]	2,221	502	671	29,197	13,260	17,741
Capital Assets (1000€)[1]	824	180	228	8,902	7,252	11,115
Operating profit (1000€)[1]	72	25	22	2,333	717	295
New establishment	16%	32%	38%	8%	16%	17%
Rejection rate[2]	12%	14%	13%	14%	9%	11%

(1) Constant 2004 SEK and converted to Euro by exchange rate €1=SEK9.30 (average for period 2004-2008).
(2) Difference in rejection rate between female-led and male-led firms is not statistically significant at 5 per cent level (t=1.63 for RDG and t=0,94 for RIG)

Descriptive statistics for firm that applied for a grant is presented in Table 3. Female-led firms that applied for the grant are smaller, have fewer employees, lower turnover, less capital assets and a lower operating profit that male-led firms. Female-led firms are more likely to apply for a grant in order to found a new establishment than male-led firms. Male-led firms are more likely to apply for a grant to invest in existing establishments.

The regression result from a logit regression concerning the likelihood that an application is appropriated is presented in Table 4. The dependent variable Approved is defined

$$Approved = \begin{cases} 1 \text{ if the grant is appropriated} \\ 0 \text{ else} \end{cases}$$

That the identity of the business manager is known (in the data set) has no effect on the likelihood that an application is approved.[13] Neither does the sex of the business manager matter for the likelihood that an application is approved. Application for grants in order to create new establishments are less likely to be approved that investments in existing establishment. A grant meant to build a new establishment is about 3 per cent less likely to be approved than a similar application for an investment in an existing establishment.

Table 4: Regression result: Dependent variable is *Approved* .

Variable	*Marginal effect*		*t-value*
Identified Business manager	-0.00694		-0.15
Female-led firm	-0.00372		-0.36
Grant for new establishment	-0.0298	***	-3.35
Positive factor income	0.0166		0.33
Previous applicant	0.0181	*	2.26
Number of employees	$1{,}76 \cdot 10^{-6}$		0.16
Capital asset per employed	$-2.86 \cdot 10^{-6}$	***	-4.00
Turnover per employed	$-2.68 \cdot 10^{-9}$		-0.00
Common equity per employed	$2.61 \cdot 10^{-6}$		1.43
Operating profit per employed	$5.67 \cdot 10^{-6}$		0.85
Manufacturing	0.0676	***	4.06
Construction	-0.0741	*	-2.47
Wholesale, retail and restaurants	0.0234		1.45
Industry services	0.0420	**	2.81
Education, care and personal services	0.0147		0.86
(Reference category: agriculture, fishery, forestry, mining)			
N	9,698		
LR $\chi^2(18)$	197,96		

Note: * p<0.05, ** p<0.01, *** p<0.001
Coefficient for yearly dummies are suppressed.

[13] Of course, the identity of the business manager may is known to the appropriating agency.

Firms that have previously applied for a grant are about 2 per cent more likely to have the application approved. The size or financial situation of the firm seems to have a modest effect on the likelihood that an application is approved. Firms in some industries are more likely to have the application approved: Investments in Manufacturing or Industry services are more likely to be approved than the reference industry (primary sector agriculture, forestry, fishery and mining). Investments in construction are less likely to be approved.

3.3. Application for grants among eligible firms

Since there seems to be no effect of the sex of the business manager on the likelihood that an application is approved, a remaining question is whether female-led firms are less likely to apply for the grant. To investigate if female-led firms are less likely to apply for the grant, I estimate the likelihood that an eligible firm applies for either the Regional Development Grant or the Regional Investment Grant. Eligible firms are those defined as eligible in Section 3.4. The dependent variable is *Applied*, defined as

$$Applied = \begin{cases} 1 \text{ if the firms has applied for a grant} \\ 0 \text{ else} \end{cases}$$

The results from the logit regression are presented in Table 5.

Female-led firms are as likely to apply for a grant as male-led firms, and female-led firms in manufacturing are almost 3 per cent more likely to apply for the grant than a similar male-led firm (significant at 10-per cent level). The size of the firm seems to have no effect on the likelihood to apply, but more productive firms in service industries (those with a higher value added per employee) are more likely to apply.

A measure of the proportion of female employment in the narrow industry of the firm is introduced as a measure of the 'gendered nature' of an industry. Generally, more 'female' industries are assumed to have a more local market and firms are seen as less inclined to grow. The purpose of the variable is to capture the *perception* of the gendered structure of an industry to the application pattern of female-led firms. The perception of the industry as 'local, low-growth firms' in the eyes of business managers *and* the appropriating agency, may discourage or encourage an application, since the rules of eligibility are known, but the practical implementation of those rules are unknown.

Firms that operate in industries with a high proportion of female employment are less likely to apply for a grant, which is in line with the hypothesis of 'discouraged applicants' discussed above. Overall a one per cent increase in the share of female employment in the industry in which the firm is active decreases the likelihood that the firm applies for a grant by 15 percent. In the manufacturing industries, where it can be assumed that the market is potentially global,

the effect of female employment is even larger: a one per cent increase in the female share of employment decreases the likelihood that the firm applies for a grant by 25 per cent.

Table 5: Regression results: Likelihood that an eligible firm applies for a grant. Dependend variable is *Applied*

	Pooled Model	Manufacturing	Services
Female-led firm♣	0.00835 (0.91)	0.0281 (1.85)	-0.0104 (-1.05)
Value added per employed	0.00603 (1.13)	0.000460 (0.08)	0.0122* (2.11)
Capital assets per employed	-0.00357 (-0.89)	-0.0000291 (-0.02)	-0.0146 (-1.04)
Number of employees	0.000486 (0.46)	0.00156 (0.64)	0.000380 (0.32)
Services♣	-0.918*** (-9.37)		
Proportion of females employed in industry	-0.158** (-2.69)	-0.0503 (-0.51)	-0.253*** (-4.02)
Previously applied for grant♣	0.145*** (45.39)	0.131*** (32.17)	0.162*** (32.98)
N	139,213	74,241	64,972
chi2	$\chi^2(27)=5492.1$	$\chi^2(16)=1255.8$	$\chi^2(20)=4054.7$

t statistics in parentheses
Variables marked with ♣ are dummy variables and reported coefficients are marginal effect. All other variables are continuous and reported coefficients are elasticities evaluated at the mean.
Yearly dummies and dummies for broad industry categories are suppressed.
* p < 0.05, ** p < 0.01, *** p < 0.001

Knowledge of the grants is important for the likelihood that a firm applies for a grant. Firms that previously have applied for a grant are arount 15 per cent more likely to apply for a grant compared with firms that have not previously applied. The effect of previous application on the likelihood to apply for a grant is greater in manufacturing than in service industries.

3.4. Eligibility criteria and the proportion of female-led firms eligible for grants

The third aspect of the gender fairness of the grant scheme is the accessibility of the grants and to what extent they benefit women. To assess the gender fairness of the grant scheme, a eligibililty analysis is made on the criteria of the grant schemes on the gender composition of the business managers in firms eligible for the grant. Each criteria is studied separately, in order to identify any criteria that have a ”gender discriminatory” effect, i.e. lead to a larger loss of female-led or male-led firms from the pool of eligible firms.

The objective of this exercise is to conclude the effect of the criteria on the proportion of female-led firms in the pool of firms eligible for the regional development grant or the regional investment grant. The effect of a particular criteria is measured as the change in the number of female-led firms compared to the change in the number of eligible firms when a particular criterion is imposed. The measure is calculated

$$\varepsilon = \frac{(q_A - q_0)}{(Q_A - Q_0)} \cdot \frac{Q_0}{q_0}$$

Where Q_A (q_A) is the number of (*female-led*) firms eligible for aid with the eligibility criterion imposed, and Q_0 (q_0) is the total number of (*female-led*) firms in the whole firm population, without any eligibility criterion imposed. If ε>1, the number of female-led firms decreases more than the total number of firms, and the share of female-led firms in the pool of firms eligible for regional grants decreases. If ε<1 the share of female-led firms increases, while the share of female-led firms among eligible firms is unaffected by the eligibility criteria if ε=1.

Table 6: Descriptive statistics for data set used in eligibility analysis.

	Year				
	2004	2005	2006	2007	2008
No of firms	341,842	350,458	362,054	359,053	366,575
No of employees	5,93	5,93	5,92	6,05	6,08
Value added per employed (1000€)[1]	34,015	35,122	35,414	38,412	34,015
Capital assets per employed (1000€)[1]	104,942	121,625	130,117	103,331	104,942
Establishment in support area	14%	14%	13%	13%	13%
Female-led firms	22%	22%	23%	23%	23%
Female-led firms with establishment in support area	11%	11%	11%	10%	10%

Notes: (1) Constant 2004 SEK and converted to Euro by exchange rate €1=SEK9.30 (average for period 2004-2008).

1.1.2 Data for eligibility analysis

For the data set used for the eligibility analysis, it is necessary to make some assumption about the firms that may be eligible for the grant. In practice, an application for a grant concerns a *project*, not a firm. To create a pool of firms that may be eligible to apply for a grant, some restricting criteria on the pool of all registered firms were imposed: Firms that do not have an identifiable business manager resident in Sweden are excluded from the eligibility analysis, along with firms that have not paid factor income exceeding SEK 100 (about € 11). This requirement leads to the exclusion of about 50 per cent of registered firms, mainly firms low or no turnover. For inclusion in the eligibility analysis, the firm should also be in the private

sector and a registered personal or limited liability firm or a co-operative society. Total factor income paid (i.e. wages and business income) should also be positive. Some descriptive statistics about the data set used is found in Table 6.

There are around 350 000 firms in the data set each year, of which 22-23 percent are female-led. The average firm has around 6 employees and average value added per employed (employees+1) is around €35,000. Capital assets per employed (employees+1) is around a million Euro. Female-led firms are less common in firms with establishments in the support area, which is one reason for the interest in gender issues in this policy area.

Female-led firms differ from male-led firms also in other ways. The average number of employees, value added per employee and capital assets per employee are lower. This reflects the fact that female-led firms more often are active in service industries, but even allowing for that fact, female-led firms tend to be smaller. This makes it necessary to study the effect of eligibility criteria on the pool of firms eligible for the grants in multiple dimensions. The results from the eligibility analysis follow in the next section.

1.1.3 Results from eligibility analysis

The elasticity of the share of female-led firms with respect to the addition of the different eligibility criteria are presented in Table 7. Regional development grants are granted to small and medium sized firms. Since women tend to run small firms rather than large firms, the elasticity of the share of female-led firms in the pool of eligible firms is less than one – i.e. the reduction in the number of female firms eligible for the grants is proportionally smaller than the reduction of all eligible firms. This would mean that the proportion of female run firms in the pool of eligible firms would increase as the criterion is applied. Men are also more likely to run firms with activities that are prohibited from receiving state aid. This means that the criterion that the firm should not be engage in an activity prohibited from receiving state aid increases the proportion of female-led firms in the pool of firms eligible for support. That the firm should have an existing plant in the eligible support area (the criterion is not *necessary* for eligibility) reduces the number of female-led firms eligible for support more than male-run firms, reflecting the population composition in the support area.

The criterion with the largest negative effect on the share of female-led firms in the pool of firms eligible for support is the criterion that the firm should operate on a larger than local or regional market.

Table 7: Marginal effect of the addition of eligibility criteria: Elasticity of the share of female-led firms eligible for Regional Development Grant and Regional Investment Grant.

Year	*SME*	*Aid not prohibited*	*Larger than local market*	*Plant in relevant support area*
Regional Development grant				
2004	0.26	0.36	1.22	1.01
2005	0.27	0.41	1.21	1.01
2006	0.27	0.38	1.19	1.01
2007	0.29	0.31	1.17	1.02
2008	0.29	0.35	1.17	1.02
Regional Investment Grant				
2004		0.36	1.22	1.01
2005		0.40	1.21	1.01
2006		0.37	1.19	1.01
2007		0.30	1.17	1.01
2008		0.34	1.17	1.02

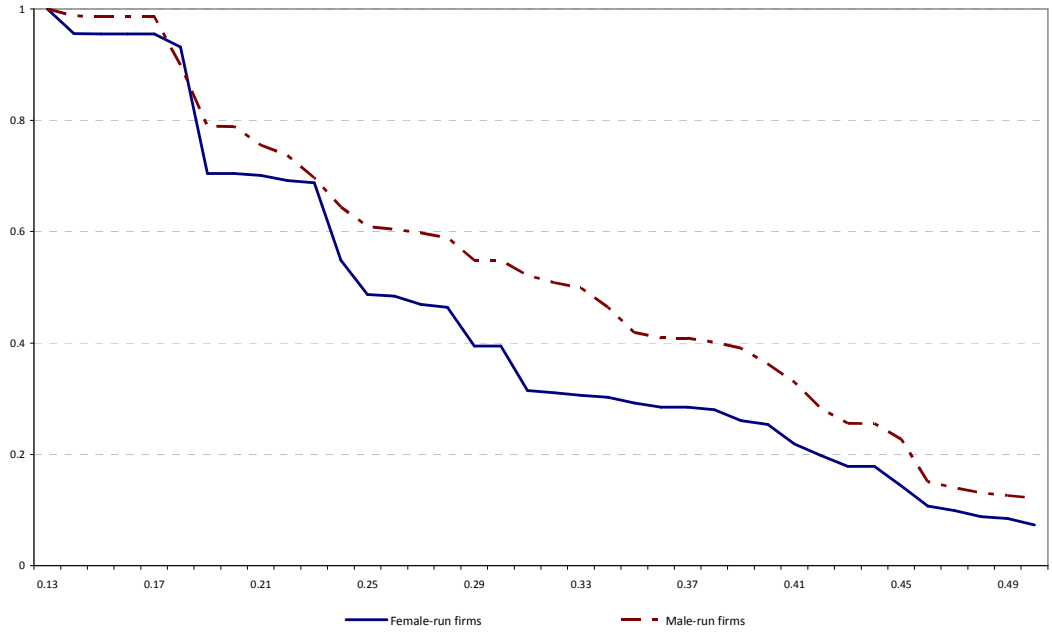
The criterion that the firm should operate on a larger than local or regional market decreases the number of eligible female-led firms 25 per cent more than the number of male-run firms. This reflects the fact that (a) business tend to be run by people who have some occupational experience in the industry and (b) the gender divided Swedish labour market. The Swedish labour market is to a large extent gender-divided, where women work in services (both public and private services), while men work in manufacturing. The service industries are more likely than manufacturing industries to operate on a local market, and hence are more likely to be ineligible for support under the rule that firms should operate on a larger than local or regional market. This can be generalized to a large part of the labour market, illustrated in Figure 1.

The gini coefficients indicating the geographical dispersion of an industry is measured along the horizontal axis. The solid line represents the share of female-led firms that are eligible for the grants, given that the cut-off level of geographical dispersion at which the market is considered 'mainly local', while the dashed line represents the share of male-led firms considered eligible for the grants.

If no restriction on geographical market size existed, all firms that meet all other eligibility criteria are included in the pool of eligible firms. If the definition of "activity that has mainly a local market" is that the activity has a gini coefficient below 0.13, all firms would be eligible for the aid programme. If a restriction on geographical market size of the industry is

introduced, the effect on the proportion of female-led firms in the pool of firms eligible for support is more severe than the effect on male-led firms, on virtually all levels of the restriction (measured on the horizontal axis).

Figure 1: Share of firms eligible for grants with a variable definition of "local market", female-led and male-run firms 2008.



The rule that the grants should be awarded in a competitively neutral way leads to the conclusion that female-led firms are less likely to be eligible for the grant that male-run firms, since women are more likely to run firms in industries with are considered active on a local or regional market.

4. Conclusions

An important aspect for sustainable rural development is that the population is roughly gender-balanced, especially among the young and fertile during the family-building phase of life. In Sweden, rural and sparsely populated areas in the north and industrial areas in decline have a surplus of men, worsened by the fact that women are more prone to migration from these areas than men.

One reason that women tend to abandon rural areas is that there is a shortage of employment opportunities for women, since the industrial structure is such that it favors traditionally male occupations. A more varied labour marked could entice young and economically active women to stay in rural areas.

Regional Investment grants and Regional Development grants are state aid grants that aim to bolster regional growth and maintaining a balanced regional development in disadvantaged areas of Sweden. One important additional objective of any funded project would be that the project improved employment opportunities for women. The capacity of the grants to be conducive to this objective is that the eligibility criteria for the grants do not effectively *conserve* industrial structure,

There are three aspects to consider when evaluating the grant scheme designs from the perspective that policy should be design with gender issues in mind: (*i*) is the rule design for the policy such that women are disadvantaged in relation to the policy goals?, (*ii*) is take-up of the policy such that similar firms led by men and women respectively, use the policy in different degrees? and (*iii*) is there evidence of discrimatory behaviour of the appropriating agency?

I find no evidence of discriminatory behaviour that disadvantages female-led firms in the application process, since female- and male-led firms have applications approved in approximately the same extent. Neither does there seem to be a problem of differences in usage of the grant programmes, since the sex of the business manager does not influence the likelihood that an eligible firm applies for the grant.

A potential problem for the uptake of the grant system among female-led firms is the rule that grants should be awarded in a way that is competitively neutral between firms within the region where grants may be granted. Since women tend to lead firms in industries that operate on a local market (mainly in service industries), the rules of competitive neutrality may be a factor that influences the potential for women entrepreneurs to receive a grant. Since there is a conflict of objectives within the policy, a specially designed programme for women entrepreneurs in rural areas may be needed, since the potential for large-scale uptake of the current regional policy grant programmes is unlikely.

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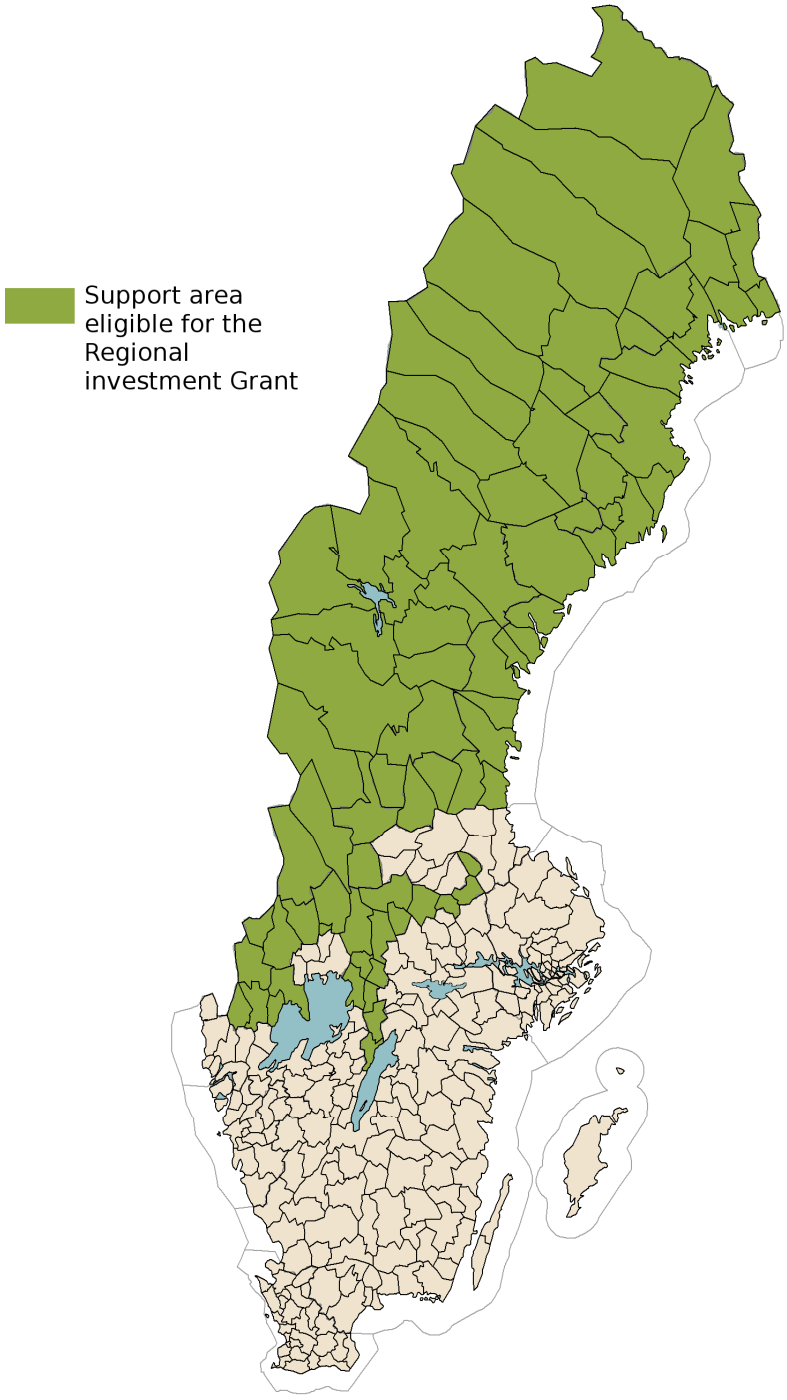
Appendix 1: Selected industries by geographical dispersion.

Rank	*Industry*	*GINI*
1	Primary education	0.16
2	Retail sale in non-specialized stores	0.17
3	Social work activities	0.17
4	Activities of other membership organizations	0.17
5	Retail sale of pharmaceutical and medical goods, cosmetic and toilet articles	0.21
6	Other land transport	0.21
7	Other service activities	0.22
8	Building installation	0.22
9	Building of complete constructions or parts thereof; civil engineering	0.23
10	Post and courier activities	0.24
11	Maintenance and repair of motor vehicles	0.25
12	Administration of the State and the economic and social policy of the community	0.26
13	Monetary intermediation	0.26
14	Letting of own property	0.26
15	Building completion	0.26
16	Mining of chemical and fertilizer minerals	0.27
17	Retail sale of food, beverages and tobacco in specialized stores	0.27
18	Secondary education	0.28
19	Other retail sale of new goods in specialized stores	0.29
20	Restaurants	0.29
21	Retail sale of automotive fuel	0.30
…	…	
197	Manufacture of basic chemicals	0.85
198	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	0.85
199	Manufacture of electric motors, generators and transformers	0.86
200	Tanning and dressing of leather	0.86
201	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	0.86
202	Manufacture of other textiles	0.86
203	Manufacture of domestic appliances n.e.c.	0.86
204	Scheduled air transport	0.86
205	Processing and preserving of fish and fish products	0.87
206	Manufacture of non-refractory ceramic goods other than for construction purposes; manufacture	0.87
207	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	0.87
208	Manufacture of motor vehicles	0.87
209	Manufacture of tubes	0.87
210	Manufacture of sports goods	0.88
211	Manufacture of weapons and ammunition	0.88
212	Manufacture of vegetable and animal oils and fats	0.89
213	Manufacture of glass and glass products	0.89
214	Manufacture of aircraft and spacecraft	0.91
215	Manufacture of refined petroleum products	0.91
216	Sea and coastal water transport	0.96

Source: Based on data from Register-based Labour Market statistics, Statistics Sweden, 2003-2008.

Appendix 2: Geographical area eligible for Regional Investment Grant



Source: Swedish Agency for Economic and Regional Growth.